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Appendix F--Quality Assurance Procedures Procedure 1--Quality Assurance Requirements for Gas Continuous Emission Monitoring Systems Used for Compliance Determination Summary of Comments and Responses

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Research Triangle Park, NC

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Appendix F — Quality Assurance Procedures Procedure 1 — Quality Assurance Requirements for Gas Continuous Emission Monitoring Systems Used for Compliance Determination

(Proposed March 14, 1984, 49 FR 09676)

Summary of Comments and Responses

Quality Assurance Division
Environmental Monitoring Support Laboratory

Emission Measurement Branch
Emission Standards and Engineering Division

U. S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711
April 1987

This report has been reviewed by the Quality Assurance Division of the Environmental Monitoring Support Laboratory and the Emission Standards and Engineering Division of the Office of Air Quality Planning and Standards, EPA, and approved for publication. Mention of trade names or commercial products is not intended to constitute endorsement or recommendation for use. Copies of this report are available through the Library Services Office (MD-35), U.S. Environmental Protection Agency, Research Triangle Park NC 27711, or from the National Technical Information Services, 5285 Port Royal Road, Springfield VA 22161.

APPENDIX F - QUALITY ASSURANCE PROCEDURES

PROCEDURE 1 - QUALITY ASSURANCE REQUIREMENTS FOR GAS CONTINUOUS EMISSION MONITORING SYSTEMS USED FOR COMPLIANCE DETERMINATION

(Proposed March 14, 1984, 49 FR 09676)

SUMMARY OF COMMENTS AND RESPONSES

Quality Assurance Division

Environmental Monitoring Support Laboratory

Emission Measurement Branch

Emission Standards and Engineering Division

U.S. Environmental Protection Agency

Research Triangle Park, North Carolina 27711

April 1987

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Table 1. LIST OF ACRONYMS USED

CD - Calibration drift.

CEMS - Continuous emission monitoring system.

CGA - Cylinder gas audit.

CRM - Certified reference material.

EPA - Environmental Protection Agency.

FGD - Flue gas desulfurization.

NBS - National Bureau of Standards.

NSPS - New source performance standards.

PS - Performance Specification (e.g., Performance Specification 2 or PS 2).

QA - Quality assurance.

QC - Quality control.

RA - Relative accuracy.

RAA - Relative accuracy audit.

RAT - Relative accuracy test.

RATA - Relative accuracy test audit.

RM - Reference method.

SRM - Standard reference material.

Chapter 1

INTRODUCTION

On March 14, 1984, the U.S. Environmental Protection Agency (EPA) published in the Federal Register (49 FR 9676) "Appendix F - Quality Assurance Procedures, Procedure 1 - Quality Assurance Requirements for Gas Continuous Emission Monitoring Systems for Compliance." This procedure was proposed under the authority of Sections 111, 114, and 301(a) of the Clean Air Act, as amended.

Public comments were solicited at the time of proposal. To provide interested persons the opportunity for oral presentation of data, views, or arguments concerning the proposed procedure, a public hearing was scheduled for April 9, 1984, beginning at 9:00 a.m. The hearing was not held because no one requested to speak. The public comment period was originally scheduled to end May 14, 1984; however, the comment period was extended to July 13, 1984 (49 FR 24151), at the request of several commenters to allow them sufficient time to develop pertinent and informed comments.

Thirty-nine comment letters on the proposed Procedure 1 were received from industry, Federal agencies, State air pollution control agencies, trade associations, and equipment manufacturers. The comments that were submitted along with EPA's responses are summarized in this document. The summary of comments and responses serves as a basis for the revisions that have been made to Procedure 1 between proposal and promulgation.

Chapter 2

SUMMARY OF CHANGES SINCE PROPOSAL

1. Section 60.13(a). The last sentence of this paragraph was changed to include the specific date of applicability.

2. Sections 60.45 and 60.47a have been revised to allow use of Methods 3, 3A, 6A, 6B, 6C, 7A, 7C, 7D, or 7E for relative accuracy (RA) testing.

3. Section 1.1. (Note: All the following section numbers refer to Procedure 1 as proposed.) The wording in the Applicability section was expanded to clarify that Procedure 1 applies to evaluation of the effectiveness of the quality control and assurance procedures and the quality of data produced by CEMS's used for compliance monitoring.

4. Section 1.2. The language in the Principle section was expanded to identify the basis for the methods in Procedure 1.

5. Section 2.4. The term span level and its definition have been omitted from Procedure 1. Succeeding sections have been renumbered appropriately.

6. Section 2.5. A sentence has been added to identify the potential sources of reference values for calibration drift (CD) determination.

7. Section 3. A sixth category, Accuracy Audit Procedure Including Sampling and Analysis Methods, was added.

8. Section 4. All of Section 4, Assessment of Data Precision, has been eliminated from Procedure 1.

9. Section 5. The title has been revised to "Calibration Drift Assessment."

10. Section 5.1. The language of this section has been changed to address the measurement of both zero (or low-level) and upper-level CD.

11. Section 5.2. The language was revised to include CD.

12. Section 5.3. The section was divided into two new sections in order to define the periods of out-of-control operation start and end.

13. Section 5.4. Sections 5.4 and 5.4.1 were combined to define the condition of out-of-control data.

14. Section 6. The title was changed to "Data Accuracy Assessment."

15. Section 6.1. The section was revised to define three types of audits: the annual relative accuracy test audit (RATA) that is required at least once per year, the cylinder gas audit (CGA) that may be used up to three times per year, and the relative accuracy audit (RAA) that may be used up to three times per year. The RATA is conducted as defined in the applicable performance specification. The CGA is a three-run, two-point audit of each analyzer using certified gases; and the RAA is a three-run RA check using methods specified in Appendix A.

16. Section 6.2. The title was changed to "Criteria for Excessive Inaccuracy" and the language was revised to define specifically the condition of the out-of-control period based on the type of audit conducted.

17. Section 7. The description of the performance audit for the sampling method testing was deleted and wording was added to the description of the RATA to require the performance audit as described in the sampling methods.

18. Section 9. The section was divided into three new sections each defining the procedures required for calculating the respective CEMS accuracy values.

19. Section 10. References to precision assessment were deleted and reporting requirements for the three accuracy audit procedures were defined.

20. Figure 1. The example format for data assessment reporting was revised to reflect the deletion of the precision assessment.

Chapter 3

SUMMARY OF COMMENTS AND RESPONSES

Section 1. Applicability.

1.1 Commenters IV-D-6 and 19.

Comment: The quality assurance (QA) procedures should be made mandatory for all continuous emission monitoring systems (CEMS's) required to be installed under the provisions of any regulation (e.g., Subpart D), permit, plan approval, consent order, decree, etc. If the quality of data from the CEMS is of no concern, a company should not be required to incur the cost of installing one.

Response: The Agency agrees that quality control (QC) and QA for CEMS data are important for every application; however, different applications require different degrees of QA and QC. Present regulations for CEMS's used as indicators of proper operation and maintenance of emission control systems include QC measures such as daily calibration drift (CD) measurements and adjustment limits and the initial performance specification (PS) tests. With the advent of regulations requiring continuous compliance monitoring, additional data, as defined in Procedure 1, are needed for the protection of both the source operator and the regulatory agency. If the Agency determines that additional QC and QA procedures are needed for CEMS's intended for other purposes, procedures will be developed and proposed.

1.2 Commenters IV-D-12, 18, 22, and 38.

Comment: Many generating stations, subject to 40 CFR Part 60, Subpart D regulations and monitoring SO_2, NO_x, CO_2, and opacity emissions, have no

computer data reduction systems, and major modifications and expense would be required to adapt these units to Appendix F. We, therefore, recommend that applicability of Appendix F be limited to CEMS's installed after the promulgation of the regulation, if at all.

Response: Appendix F, Procedure 1, has been developed in response to obligations made when Subpart Da was promulgated in 1979. That is, the Da regulation required the CEMS to be the compliance method and that specific procedures must be implemented to assure that data supplied by CEMS's for compliance be of known accuracy and precision.

The proposal of revisions to Subpart D (48 FR 48964) includes the use of CEMS's for compliance determination on a 30-day rolling average basis. This significant change for Subpart D sources will cause major modifications to computer-operated systems. The proposal includes a 1-year development period to accommodate such changes. The Agency believes that addition of Procedure 1 requirements to other changes being considered for Subpart D sources will not be burdensome and the promulgated Procedure 1, with the changes included since proposal, is applicable for evaluating CEMS's on present and future Subpart D sources should they become subject to continuous compliance requirements.

1.3 Commenters IV-D-21 and 31.

Comment: We recommend that similar regulations be proposed for Subpart D sources and the public be allowed another opportunity to comment on this procedure.

Response: As mentioned in the preamble to the proposal, Procedure 1 will apply to Subpart D sources should they become subject to continuous compliance provisions. Thus, interested persons have had the opportunity to comment on the application of Procedure 1 to Subpart D. The Agency sees

no reason to provide further opportunity for comment on this application. At this time, the Agency has not considered similar QA requirements on CEMS's that produce data only for operation and maintenance monitoring; if the Agency determines such a need, the public will be allowed to comment on proposed procedures.

1.4 Commenters IV-D-23, 25, 31, and 38.

Comment: This proposal is unfair in two ways. (1) It is being developed to apply to future sources which are currently not identified; these unidentified sources have no way of knowing whether they will be affected at some future date. Not knowing they will be affected, they are precluded from taking part in the rulemaking process to ensure their interests are appropriately addressed. (2) The burden placed on nonutility sources will generally be much greater per unit ton of emission than the burden placed on utility sources.

Response: Procedure 1 affects only Subpart Da sources; at present, Procedure 1 does not apply to other sources. If the Agency determines that Procedure 1 should apply to other source categories, the applicability of Procedure 1 will be proposed with the regulatory revision and subjected to comment and review by all affected facilities and related organizations.

1.5 Commenter IV-D-32.

Comment: Our four coal-fired units have successfully held emissions well below established sulfur dioxide limits without the use of scrubbers. For example, we are able to achieve an emission level of 0.72 lb/MMBtu when the standard is 1.2 lbs/MMBtu. It hardly seems appropriate to apply stringent QA procedures to companies that burn compliance coal. We do not foresee

any environmental benefit from the proposed regulations and yet our rate-payers must subsidize the added requirements.

Response: The commenter may be referring to a fuel analysis option for determining compliance with emission standards, in which case, the Procedure 1 requirements are not applicable. Another procedure in Appendix F would be necessary for such an application and this is not yet available.

If the commenter is referring to a CEMS applied to a Subpart D source, the owner/operator may apply to the Agency for approval of an alternative procedure under provisions in 40 CFR 60.71(i). This is a source specific issue and is not addressed in Procedure 1.

1.6 Commenters IV-D-33 and 36.

Comment: Six months is insufficient time to educate the different stations on the QA procedures, to implement the necessary data collection and reduction (data precision), to write and implement written procedures (QC requirements), and hire additional personnel. Several of these requirements will require reprogramming for the CEMS computer systems (i.e., ability to delete emission data invalidated by out-of-control periods, ability to add data collected by alternate means). These computer program changes could be construed as a "major modification" to the CEMS which would require retests of the CEMS to check compliance with the PS tests. Each station would have to hire and train personnel to collect and reduce the data required by the precision checks and additional test personnel would have to be hired to do the relative accuracy audits (RAA's) and the cylinder gas audits (CGA's). This would require significant

additional time to comply with the proposed regulations. We would suggest that Appendix F be applicable no earlier than 1 year after promulgation.

Response: The requirements of Subpart Da (promulgated in 1979) already define the capabilities a CEMS must have to handle data reduction. Procedure 1, as promulgated, does not add to these requirements. There are some additional reporting requirements for the audits results and out-of-control descriptions that are a result of implementation of Procedure 1, but these should not significantly affect work load. Preparation of a QA plan is the major initiating project for these sources, and the Agency believes that 6 months is sufficient time to implement the procedures required to comply with Procedure 1.

The proposed Subpart D revisions include a 1-year preparation period before implementation. If these revisions promulgate a continuous compliance provision as proposed, this 1-year period will be sufficient to complete computer operation changes required by both the Subpart D revisions and the Procedure 1 requirements.

1.7 Commenter IV-D-35.

Comment: We seek confirmation that Subpart D generating units that use other methods for demonstrating compliance with emission limits will not be affected by the Procedure 1 proposal. We also seek confirmation that the requirements of Procedure 1 are not applicable to opacity monitors.

Response: Procedure 1 applies only to gaseous emissions CEMS's used for compliance monitoring. It does not apply to opacity monitors (transmissometers), nor to other means of monitoring emissions, such as

fuel sampling and analysis or manual methods of emission sampling. The Agency is reviewing and developing appropriate QA requirements for these monitoring approaches.

1.8 Commenter IV-D-35.

Comment: We are concerned that the proposed rules may be misconstrued to apply to CEMS's on generating units not subject to Subpart D or Da. We, therefore, request that the Agency acknowledge in this rulemaking that monitoring systems on older generating units may not be capable of complying with the rigorous testing and criteria in the Procedure 1 proposal. Emphasis of this point may be valuable in the event that other regulatory agencies seek to apply the Procedure 1 requirements to CEMS's existing units.

Response: The applicability section of Procedure 1 is very specific on this point. The preamble to the promulgation also discusses this issue. The Agency believes that sufficient explanation and clarification are included.

1.9 Commenter IV-D-39.

Comment: Make it clear that Appendix F is intended to address minimum QA requirements that should be implemented by sources after the source initially demonstrates that its CEMS's have met the relevant PS's.

Response: In discussing the applicability, Section 1.1, Procedure 1 is very clear on this point. Procedure 1 states "This procedure specifies the minimum QA requirements necessary for control and assessment of the quality of CEMS data submitted to EPA." 40 CFR 60.13(c) is also specific that all CEMS's shall comply with the provisions of the PS's in Appendix B within 30 days of performance tests required in 40 CFR 60.8. This requirement has not been changed.

1.10 Commenter IV-D-6.

Comment: We would prefer that EPA include language specifically stating that, since these procedures are minimum requirements, States are encouraged to develop modifications of the procedures more suitable to their individual CEM programs.

Response: The introductory section of Procedure 1 includes specific encouragement to source operators to expand on the QA procedures in order to address specifically the needs of individual CEMS installations. Similar encouragement to regulatory agencies is contained in Section 60.10 of the General Provisions which provides that State or local agencies may implement additional requirements to new source performance standards (NSPS).

1.11 Commenters IV-D-35 and 36.

Comment: Low-capacity units which include units that typically operate on a seasonal cycling mode, units that remain on cold standby for prolonged periods of time, and units that remain on hot standby (operation solely to maintain boiler pressure) for several days at a time should not be subject to Procedure 1 requirements. The Agency should also consider exempting from Appendix F those units which burn gas and oil, if oil represents less than 25 percent of the total annual heat input.

Response: Definition of which sources are subject to continuous monitoring regulations is not within the scope of Procedure 1. This issue is defined within the applicable regulations which include criteria for

minimum source operating levels and time for determination of applicability. Note that if a source is subject to a continuous monitoring requirement and a CEMS is applied, an initial relative accuracy test (RAT) is required regardless of the implementation of Procedure 1. If the CEMS data are used for compliance determination, Procedure 1 would then be applicable.

Source operators do have the opportunity to apply for alternative procedures under the General Provisions in 40 CFR Part 60. Such alternative procedures could include alternative QC and QA procedures, as well as, measurement methods.

1.12 Commenters IV-D-23 and 25.

Comment: The CEMS data should be used only to monitor operation and maintenance, not to determine compliance.

Response: The decision that CEMS's are appropriate compliance tools for NSPS is not within the scope of this regulatory action. Such a determination was made with respect to Subpart Da in the Subpart Da rulemaking and is a subject of the pending Subpart Da rulemaking. Procedure 1 provides a basis by which to judge whether the data provided by a CEMS are valid for compliance determinations.

Section 2. Definitions.

2.1 Commenters IV-D-2, 6, 17, and 20.

Comment: Use of the terms "span value" and "span level" is confusing. Use of "full scale value" in place of "span value" and "precision check value" in place of "span level" may help to clarify the definitions. In addition, all span levels should be within plus or minus 10 percent of the

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Response: Span value is not necessarily the same as instrument range. Span value is defined in PS 2 as: "The upper limit of a gas concentration measurement range specified for affected source categories in the applicable subpart of the regulations." Span value is defined in the applicable regulations and corresponds to a concentration value about 1.25 times the maximum expected pollutant concentration for uncontrolled emissions or 80 percent of the maximum expected value for controlled emissions.

The span value, instead of the CEMS range, is used as the basis for calculation of CD so that the limits of acceptability are equitably enforced. Also, in this manner the drift specifications are directly related to applicable emission standard and are more meaningful than instrument-specific values would be.

Specifying cylinder gas values as percentages of the applicable emission standard is inappropriate for most CEMS applications. It is inappropriate because the emission standards are not defined in concentration units but require calculations using data from more than one gas analyzer. To deal with this, Procedure 1 requires that the CGA include a point at 50 to 60 percent of the span value which will approximate the level of the pollutant concentration corresponding to the emission standard.

Similarly, defining "normal operating levels" of diluent gases within 10 percent is difficult for most sources. The Agency has defined a range of diluent gas concentrations for the CGA. This range corresponds to the

fossil fuel-fired boilers. These values may not apply to other emission sources and will be reviewed when other EPA regulations require CEMS for continuous compliance determinations at other sources.

The definitions section of Procedure 1 has been revised to clarify the use of these terms.

Section 3. QC Requirements.

3.1 Commenter IV-D-11.

Comment: These requirements should include monitor siting criteria and data validation criteria.

Response: The monitor siting criteria should be addressed prior to installation and be adequately certified by the PS test results. The fourth factor in Section 3, data reporting and recording, should include data validation criteria such as spot checks of calculations and periodic checks of the integrity of computer manipulations.

The Agency believes the list of QC requirements in Section 3 can and should be expanded by the source operator to reflect more accurately the needs of a particular system.

3.2 Commenter IV-D-13.

Comment: The QC requirements of Section 3 should be standard procedure for all CEMS operators.

Response: The Agency agrees with this sentiment. Some QC procedures are mandated for CEMS's installed in compliance with 40 CFR Part 60, but Procedure 1 is the only regulatory section requiring written QC procedures.

3.3 Commenter IV-D-21.

Comment: Section 3 should require the inclusion of an alternate method of obtaining emission data when the CEMS is considered out-of-control.

Response: The Agency agrees that a source subject to minimum data requirements should be prepared if alternate sampling is required. Procedure 1 includes six major categories for a QC program plan with one listed as "Program of corrective action for malfunctioning CEMS." The plan under this category should include alternative emission testing procedures.

3.4 Commenter IV-D-28.

Comment: Procedure 1 specifies that if excessive CEMS inaccuracies occur two consecutive quarters, the QC procedures must be rewritten to correct the deficiency. It is generally recognized that the design of the CEMS's (especially the vintage installed at Subpart D sources) has not achieved the level at which continuous, reliable operations can be reasonably expected. Thus, it is the instrument design that is typically the limiting factor to monitor performance, not QC procedures. While it is recognized that QC can improve monitor performance, it is erroneous to assume that simply revising a procedure will fully correct data deficiencies. We recommend that this requirement be deleted.

Response: If a CEMS fails to meet any of the relative accuracy (RA) criteria on the first attempt for two quarters in succession, that is good indication that the CEMS and the QC program are in need of serious review and revision. The source operator should conduct this review and make changes necessary to ensure successful operation of the CEMS. The required action may be to revise the QA/QC procedures, or it may be to replace the CEMS because of poorly designed equipment.

The Agency recognizes that the design of a CEMS and its specific application are important factors in determining whether the CEMS will operate successfully. The first step in a good QC program is selection of good, durable, accurate equipment suitable for the intended application. The source owner/operator is responsible for this selection. The owner/operator should be as well-informed as possible about CEMS operation and application. Manufacturer's information, advice from source testing consultants, technical publications from EPA and others in the industry can provide excellent guidance in this area.

3.5 Commenter IV-D-34.

Comment: Appendix F should include requirements that plant specific QA procedures include manufacturer recommendations for assurance of data precision and accuracy. In addition, Appendix F should give more detail on establishing a QA program at a given facility. The regulation guidelines for plant QA programs should be expanded to include as a minimum:

1. The assignment of CEMS responsibility to specific personnel for meeting QA objectives.

2. Operator training in all aspects of CEMS operation and maintenance.

3. The keeping of a service and maintenance log for the CEMS.

4. The establishment of a spare parts inventory for the CEMS.

5. Security for the CEMS and all output data.

6. Implementation of routine weekly, monthly, and quarterly CEMS maintenance schedules.

7. Periodic audits of CEMS precision and accuracy.

Response: The Agency agrees with the commenter that these are important considerations for a QC program. The proposed and promulgated versions of Procedure 1 include these and other QC issues in the list of general headings for the required QC program. The Agency has chosen to recommend several critical elements as the commenter has done and leave the responsibility to the owner/operator to develop an appropriate QC program with the help of the manufacturer, if necessary.

Section 4. Assessment of Data Precision.

4.1 Commenters IV-D-4, 6, 11, 13, 19, 20, and 27.

Comment: Assignment of cylinder gas or gas cell concentration values from CEMS readings should not be allowed. Such a practice could result in CEMS data that would be precisely wrong. If there is an undetected analyzer malfunction between the time of certification and the time of assignment of calibration values, use of the gas or cells would not provide a valid check of the analyzers. Determination of calibration standard values should utilize reference method (RM) procedures.

Response: The purpose of the CD checks is to determine whether the CEMS has the ability to repeat its response to a specific input over known time intervals. It is, therefore, not necessary to know the input values with absolute accuracy, only that the value is stable.

The Agency would encourage the CEMS operator to include evaluation of all calibration gases or cells as part of the QC procedures. Such additional knowledge can only enhance the quality of the CEMS data; however,

the Agency believes that, such, rigorous analyses are not required for the purpose of the CD measurements. The additional analyses should be left to the discretion of the CEMS operator.

4.2 Commenters IV-D-3, 5, 6, 7, 12, 14, 17, 27, 32, 35, and 36.

Comment: Present regulations require a daily zero and span CD check in accordance with a written procedure and provide guidelines on when to adjust the zero and span points. This in itself is QA, and we feel this procedure most accurately represents instrument precision. Using all of the daily span checks to calculate analyzer precision would not further the information on CEMS performance and would impose unnecessary recordkeeping and reporting requirements. We recommend that Section 4 be deleted.

Response: The Agency agrees that daily drift checks are part of QA, but these checks alone are insufficient. It is also necessary to conduct frequent equipment RA checks. The Agency has determined that the combination of daily drift checks and periodic RA checks provide the necessary QA for these CEMS's.

The Agency agrees that the precision calculation and reporting are unnecessary for QA. The precision check section has been removed from Procedure 1.

4.3 Commenters IV-D-6, 12, and 28.

Comment: The precision of the analyzer zero should also be determined daily. An error in the analyzer zero can affect CEMS output

just as much as upscale drift. Zero drift should be treated identically to span drift. Another determination of instrument drift would be the percent difference in the CEMS output calibration span value minus the zero value for successive days.

Response: The Agency agrees that the CEMS zero drift should be monitored as well as the span drift. Both of these measurements are indicators of CEMS CD. However, the Agency disagrees that zero drift should be subtracted before calibration span drift is measured if calibration span drift is the only indicator of CEMS stability. The purpose of the drift measurements is to monitor the CEMS response to repeated reference value inputs. These inputs are intended to simulate stack gas measurements to some degree, and it would be of less value to allow adjustment to the CEMS response for the drift check while measurements of stack gas concentration are unadjusted.

With both measurements required, it would be permissible to measure an unadjusted zero drift followed by the measurement of an adjusted span drift. Indication that either CD measurement exceeded the limit would be cause for corrective action. The promulgated Procedure 1 reflects this change, including criteria for acceptable limits for both zero and span CD's.

Section 5. Zero and Span CD.

5.1 Commenter IV-D-5.

Comment: The requirement for an RAA after an "out-of-control" period is reasonable, especially if major repairs were required. However, in order to reduce the impact of these audits on the scheduling of other tests, the

2-week deadline should be extended to a month. We also feel that this audit should be counted as an annual audit thereby changing the date for the next required annual audit to 12 months after the out-of-control audit.

Response: Procedure 1 defines the out-of-control situation for two CEMS deficiencies. The first results from the CEMS being unable to meet the excessive drift criteria. The Agency has determined the RATA is unnecessary following a correction for excessive drift in most cases. The promulgated Procedure 1 reflects this change from the proposal.

The second CEMS deficiency leading to out-of-control designation is failure to pass the RA assessment, either the quarterly audit or the annual RATA. It is necessary to repeat the audit or the RATA following repairs. The repeated RA assessment is counted as the quarterly or annual audit, as appropriate, and no other provisions in Procedure 1 are necessary.

5.2 Commenters IV-D-6, 11, and 36.

Comment: Since the 24-hour drift specifications must be met by a CEMS in order to be certified, it seems appropriate to consider a CEMS out-of-control when the drift exceeds twice the specification on <u>any</u> day. Our experience indicates that requiring adjustment whenever the specification is exceeded is not overly burdensome.

Response: A single measurement in excess of the lower drift limit may be an indication of CEMS problems, but may also be a result of a statistical aberration, dirty windows which may be easily cleaned,

or a nearly empty gas cylinder. Five consecutive excesses would be a positive indication that a serious problem exists and the CEMS should be repaired immediately. The Agency believes that declaring a CEMS to be out-of-control based on one violation of the lower drift limit is excessive.

5.3 Commenter IV-D-9.

Comment: We recommend that this section be revised so that adjustment of the zero and span be required whenever the drift exceeds four times the cell value instead of the proposed criteria of two times the limit which is unrealistically restrictive.

The criteria for defining monitor out-of-control should be changed to "four times the applicable PS in Appendix B for five consecutive span checks." An acceptable alternate would be "3 percent of full scale for five consecutive span checks."

Response: The commenter has confused instrument scale and the term "span value" used in Procedure 1. The drift limits in Procedure 1 are referenced to the span value for that source category, not the calibration cell value or the instrument full scale value. In this manner, the drift limits are directly related to the emission limits of the regulation, rather than the site-specific instruments. The limits in Procedure 1 are greater than those recommended by the commenter in terms of actual drift.

5.4 Commenters IV-D-11 and 31.

Comment: It seems inconsistent that a monitor is considered out-of-control only after five consecutive excessive drift measurements

when the desired goal is the collection of valid, representative data. Specify a minimum acceptable data capture, general guidelines for acceptance of data, and the means by which to collect the data. Then allow operators to use their discretion in meeting data capture requirements.

Response: The Agency has specified minimum data capture requirements in Subpart Da and has proposed similar requirements in Subpart D for compliance determinations. Procedure 1 defines the criteria and procedures by which to determine the validity of the CEMS data and those periods when the CEMS is to be considered not operating within acceptable bounds. CEMS operators who must comply with applicable regulations are then expected to meet the data capture requirements within these criteria.

5.5 Commenters IV-D-9, 11, 12, 23, 25, 27, 35, and 36.

Comment: Conducting an RAA everytime corrective action for excessive drift is performed is excessive.

Response: The Agency has determined that, in most cases, a CEMS that shows excessive drift can be returned to proper operation by correction of the drift problem and that a subsequent RA assessment is unnecessary. The promulgated version of Procedure 1 reflects this view with a change in the corrective action needed for exceeding the drift criteria.

5.6 Commenter IV-D-12.

Comment: The definition of "unacceptable data" in Section 5.4 specifies that the previous day's data are unacceptable if an individual CD exceeds four times the applicable limit. This definition of unacceptable

data would create numerous recordkeeping and notification problems in that it would require monthly recalculation of rolling average data. When the cause or time of drift can be determined, it may not be necessary to invalidate an entire day of previous data. We recommend that the definition of unacceptable data be based on a larger drift than 10 percent. When drift is caused by identified maintenance or the exact time of drift can be determined, the data should not be invalidated.

Response: The Agency believes that a CD of over 10 percent of the span value is a strong indication that the CEMS is in need of direct attention and is probably in need of repair. Data collected under such conditions are unreliable and should not be included in a set of valid data. If the cause of the drift problem and the time of its occurrence can be accurately identified, it would be possible to delete only those data affected by the change in CEMS response. Such data validation procedures should be clearly outlined and presented to the Administrator as a request for alternative procedures.

Further, any recalculation of rolling averages would be for only the period ending on the day of excessive drift. This would be one 30-day average for a Subpart Da source with a computer program designed to calculate the emission rate at the end of a verified boiler operating day as directed by the regulation.

5.7 Commenter IV-D-7.

Comment: Procedure 1 should recommend (or require) a CEMS calibration check with a standard other than the daily span source with a frequency within 90 days.

Response: The Agency believes that the quarterly audit procedure with either the RAA or the CGA and the only drift check are sufficient checks of the CEMS calibration and measurement accuracy. The source owner is encouraged to incorporate more frequent calibration checks and other CEMS QC procedures suitable for specific CEMS installations in the introduction to Appendix F.

5.8 Commenter IV-D-19.

Comment: A sentence should be added requiring that the duration of zero and span checks be adequate to reflect properly the stabilization of the monitor. Experience has shown that, in some instances, these checks are being performed too rapidly to characterize monitor response adequately.

Response: Procedure 1 references procedures for zero and span checks as set forth by the equipment manufacturers. These procedures should include criteria for response time and CEMS stabilization that are applicable for the equipment being tested. The Agency agrees that such considerations are important in measuring CEMS drift, but the procedures and criteria are application-specific. Appendix F specifies acceptability limits for CEMS checks and tests which will prevent loose operation of CEMS's.

5.9 Commenter IV-D-28.

Comment: Procedure 1 requires that the source operator use alternate methods of obtaining emission data when the CEMS is out-of-control. It should be noted that the current requirements for Subpart D sources contain no provisions for minimum data capture or alternate measurement methods.

Thus, implementation of Appendix F could require significant expenditures at Subpart D sources for alternate monitoring. The cost and manpower requirements associated with the installation and operation of these alternate systems would be substantial.

Response: Procedure 1 does not require source operators to conduct alternate monitoring during periods of CEMS out-of-control operation. This is a provision of the applicable regulations which include minimum data availability criteria. Testing with an alternate method should be done only to meet the minimum data availability requirements. Procedure 1 defines the criteria which determine when a CEMS is out-of-control and the CEMS data are not valid for meeting the minimum data availability requirements. It is a vital part of any QC program to provide a method(s) for alternate monitoring and to be prepared to implement such as necessary.

5.10 Commenter IV-D-28.

Comment: Procedure 1 requires that data collected during a monitoring system breakdown be retained for EPA inspection. The requirement to collect and store such data will involve significant changes to current data acquisition system. Currently, information that is known to be faulty is not retained. Given that such data have no value to the company, and given that the EPA has not identified any potential value which the data may have, the company concludes that the requirement to collect and maintain data files of useless information is not worth the expense involved and should be deleted.

Response: This statement in Procedure 1 to retain all CEMS data is a restatement of the regulatory requirement in 40 CFR 60.7(d). This paragraph requires the source operator to maintain a file of all CEMS data for at least 2 years.

5.11 Commenter IV-D-32.

Comment: The proposed rule for corrective action for excessive span drift, the source owner or operator must use another method of obtaining the minimum emission data as required and described in the applicable subpart [e.g., 60.47a(f)]. We suggest that EPA consider the alternative of allowing a source owner to replace a monitor that is out-of-control with another CEMS. Many times a source owner has another CEMS available. Also, purchasing an extra CEMS for these situations may be less costly than the process of stack testing.

Response: Applying another CEMS in place of one that is out-of-control is certainly a valid alternative monitoring procedure. The alternate CEMS would be subject to the same PS certification and QA procedures as any other CEMS used for compliance monitoring.

5.12 Commenter IV-D-33.

Comment: The CD limits and corrective action sections need clarification. Does "five consecutive span checks" mean five daily span checks (i.e., over 5 days) or five consecutive span checks on the same day? It is possible to exceed the PS for span checks and not affect the previous data. For example, in a computer initiated and compensated span check in

which the gas cylinder is emptied or has the wrong gas, the span check would be out of specifications; however, the previous data would not necessarily be affected. We would recommend more flexibility in determining out-of-control and system breakdown periods. We would suggest that each of the incidences must be reviewed to determine the status.

Response: Procedure 1 references the drift specifications in PS's 2 and 3 that are stated as measurements of 24-hour drift. The Agency is aware of various CEMS problems that can cause apparent drift problems when none exist. The allowance for 5 days of consecutive excess drift provides time to identify and correct such problems. The Agency believes that excesses continuing for longer periods indicate serious CEMS operational problems or poor maintenance, either of which is cause for immediate critical review and corrections.

5.13 Commenter IV-D-35.

Comment: Under Section 5 of proposed Procedure 1, a monitor is considered to be out-of-control if the span drift exceeds "twice the applicable PS in Appendix B for five consecutive span checks." For NO_x and SO_x CEMS, twice the allowable span drift is only 5 percent. The appropriate criterion for a particular monitor would be calculated by taking 5 percent of the span value as that term is defined at Section 2.4 of PS 2 in Appendix B and Section 2.3 of proposed Procedure 1 ("the upper limit of a gas concentration measurement range that is specified for affected source categories in the applicable subpart of the regulations"). Thus, for an

NO_x monitor at a solid fuel-fired Subpart Da generating unit, the criterion would be 5 percent of the 1000 ppm span value specified at 40 CFR §60.47a(1)(3), or 50 ppm.

Response: This is correct.

5.14 Commenters IV-D-5, 31, and 35.

Comment: Since NO_x and diluent emissions are primarily controlled by boiler design, it is unlikely that NO_x or diluent emission rates would vary significantly during a monitor outage. We propose that alternative monitoring requirements for NO_x or diluent during CEMS outages be deleted from the proposed regulations.

Response: The commenter's suggestion to use historical data for limited periods of CEMS inoperation could be a valid alternative method. As such it could be considered by the Agency as an acceptable alternative method if proposed for a specific application and included criteria for process control and monitoring, data acquisition and reduction, period of alternative monitoring, and proposed corrective action for CEMS. Such alternative monitoring could apply not only to NO_x emissions, but also diluent concentration under restricted circumstances. Review by the Agency of any alternative procedures is necessary before approval for specific or general use.

5.15 Commenter IV-D-36.

Comment: The proposal states that if the span drift exceeds twice the applicable monitor drift limit for five consecutive span checks, or four

times the monitor drift limit for a single span check, the monitor is out-of-control. Twice the allowable span drift is only 5 percent. Since EPA has not included in the docket or discussed in the proposal any analysis of drift data that would support these criteria, EPA has not demonstrated that available CEMS's could meet this out-of-control criteria based on span drift. In fact, in an extensive CEM demonstration project conducted by EPA in 1980-81, CEMS's were unable to satisfy these out-of-control criteria a substantial portion of the time. As a result, under these proposed criteria, much of the data collected during this project would have been invalidated.

Response: The Agency reviewed the data analyses provided by the commenter and disagrees with the commenter's evaluation on a couple of points. First, the commenter used a span value corresponding to the value of a cylinder gas used to calibrate the CEMS rather than the applicable span value. The span value in this case was significantly greater than the cylinder gas value and would thus produce drift results lower than those the commenter calculated. Second, the commenter divided relatively long periods of poor CEMS operation into individual cases of out-of-control operation. If the procedures in Procedure 1 were followed, many of the periods exceeding drift limits identified by the commenter would be consolidated into relatively few out-of-control periods that would have ended only when corrective action was completed.

The Agency has reviewed long-term drift data from five other CEMS installations. These data indicate that the drift specifications in Procedure 1 will be exceeded less than 1 percent of the CEMS operating time.

5.16 Commenter IV-D-6.

Comment: Additional criteria should be added to determine "unacceptable data" status. Examples are pollutant or diluent monitor malfunction, process not operating, etc. Also, minimum data requirements for calculation of various time-averaged concentrations or rates should be specified.

Response: The criteria listed in Appendix F apply to the QC and QA measurements that are specified in the procedure. It is not within the scope of Procedure 1 of Appendix F to define acceptable process conditions, regulatory averaging time, or minimum data requirements. These issues are addressed in the applicable regulations.

Section 6. Assessment of Data Accuracy and Corrective Action for Excessive Inaccuracy.

6.1 Commenters IV-D-1, 4, 6, 7, 8, 9, 11, 12, 20, 21, 30, 32, 33, 35, and 36.

Comment: We recognize the need for conducting QA checks on a CEMS; however, we believe that the quarterly assessment of data accuracy is far too stringent, costly, and time-consuming. The frequency of audits should be changed to once per year, as recommended by some commenters, or less frequent schedules as recommended by others.

Response: The commenters provided no substantial amount of data supporting a reduction of audit frequency to less than quarterly. The quality of CEMS data is a function somewhat of CEMS design and specific application and more importantly of equipment maintenance which includes instrument response checks, parts cleaning and repair, and maintenance of expendable supplies. However, the only measure of the effectiveness of the QC measures is a periodic accuracy audit. To reduce the testing burden, Procedure 1 has been revised to require an RAT as per PS 2 once a year and to allow the use of CGA, where applicable, or a reduced number (three runs instead of six or nine) of RA method tests for three quarters.

6.2 Commenter IV-D-4.

Comment: If a monitoring system can demonstrate at least a 1-year period of successful QA audits, we believe that a longer time period between audits for that particular monitoring system could be allowed without compromising the overall quality of the data generated by the monitoring system.

Response: This is an approach worth consideration under an alternative procedure review on a case-by-case basis. The Agency would need to review the background data before considering such a relaxation.

6.3 Commenters IV-D-4 and 17.

Comment: Procedure 1 proposes that the appropriate performance audit sample be analyzed with each RATA performed. We support this position and recommend that either failure to analyze the performance audit sample or

unacceptable analytical results on the performance audit sample should be made grounds for invalidating the RATA. Further discussion in Procedure 1 is necessary.

Response: The promulgated version of Procedure 1 references the performance audits in the applicable RM's as these have been promulgated (49 FR 26522) since the proposal of Appendix F. These procedures in the respective methods include a provision for retesting if the performance audit limits are not met.

6.4 Commenter IV-D-4.

Comment: We have noted a discrepancy in the CEMS responses produced by two different audit gases supplied by different sources.

Response: Procedure 1 specifies the use of audit gases directly comparable to the National Bureau of Standards (NBS) Standard Reference Materials (SRM), or NBS/EPA approved gas manufacturers' Certified Reference Materials (CRM) prepared following EPA's Protocol 1, or the direct use of CRM gases. If gases of this quality are compared, there should be no significant differences in the produced instrument responses.

6.5 Commenter IV-D-5.

Comment: Analyses of coal samples taken to verify heating value and sulfur content could be used to check independently the calibration of the monitor to determine if it is out-of-control in terms of data accuracy.

Response: Review of fuel analysis data for different sampling periods shows that the imprecision associated with daily samples is much greater than the limits of drift specified for CEMS. For this reason, comparison

of the data produced by these two methods on a daily basis would not be appropriate for determining an out-of-control condition for CEMS's.

6.6 Commenters IV-D-6 and 11.

Comment: For an RAA, a test run of three samples should be sufficient to identify major problems with the CEMS.

Response: The Agency agrees that comparing the mean results of three RM test runs would be a good indicator of CEMS performance. The revised Procedure 1 includes a provision to allow this abbreviated RAA for three of four quarters with an RAT as per PS 2 required annually.

6.7 Commenter IV-D-6.

Comment: The CGA audit points used should be those specified for calibration error testing in EPA-450/3-82-026, including the zero level.

Response: The purpose of the CGA is to audit the accuracy of the CEMS response at gas concentrations in the range expected during normal operation. The values specified in Procedure 1 reflect this purpose. The zero level is not needed.

On the other hand, the purpose of the calibration error test in the CEMS Guidelines (EPA-450/3-82-026) is to provide a procedure for checking the calibration linearity or calibration accuracy of the analyzer. This procedure does not include the entire CEMS sampling system and is not designed as an auditing technique.

6.8 Commenters IV-D-6, 7, 13, 26, and 30.

For monitors using gas cells for calibration, cells should be allowed for the audit.

Response: An independent procedure for determining accurately the the appropriate instrument response a gas cell should produce has not been developed. Without independent cell certification, the use of gas cells for accuracy auditing is uncertain and undesirable.

6.9 Commenter IV-D-6.

Comment: The CEMS should not be considered out-of-control based on the result of an RAA or CGA. The audits are not, as now specified, consistent with the complete RA or calibration error test procedures used for CEMS certification. The audits should be used to trigger repetition of the certification procedures within a specific time period. Failure to meet the actual certification specification should be the criteria for out-of-control status.

Response: The Agency believes that an RAA or a CGA resulting in failure of the CEMS to meet minimum requirements would be a very strong indication that the CEMS was in need of corrective action. There would be no purpose in conducting another audit, RAT, or performance certification test until the cause of the problem was found and rectified. An additional certification test or audit before a corrective action would be unnecessary.

6.10 Commenter IV-D-6.

Comment: Use of effluent volumetric flow rate and actual heat input for the unit should be allowed for determination of SO_2 in lb/MM Btu.

Response: Use of these alternative procedures for the determination of RA or alternative compliance procedures is not within the scope of this action, nor is it within the scope to change any RAT requirements in PS's 2 and 3. Review of alternative procedures is conducted by the Agency on a source specific basis and operators or testers are encouraged to contact the applicable regulatory agency with requests for such review.

6.11 Commenter IV-D-7.

Comment: We have some concern regarding the auditability of some nonextractive CEMS. The EPA should require all CEMS manufacturers to have an EPA-approved method or procedure for effectively auditing CEMS with gas cylinders, gas cells, or optical filters. New CEMS should be designed to provide the capability for a cylinder gas, gas cell, or optical filter audit. All CEMS presently in operation should be required to be retrofitted to accommodate auditing. We are currently aware of at least two nonextractive analyzers which could not receive the CGA as described in the proposed Procedure 1.

Response: Procedure 1 does not require that all CEMS's be auditable using cylinder gas, but allows the CGA where it is applicable. Procedure 1 includes another audit procedure--the abbreviated, three-run, RAA--which should be used when other procedures are not applicable.

It is the policy of the Agency not to specify the design of CEMS equipment if means are available for certifying the proper operation of

that equipment without a design change. For determining measurement accuracy, the RATA and the RAA are available and an equipment design specification is not necessary.

6.12 Commenter IV-D-7.

Comment: The phrase "whichever is greater" should be deleted from the RA limit statement.

Response: The phase "whichever is greater" is necessary to distinguish between the conditions for selecting the appropriate limit. The 25 percent of RM mean value limit applies when emission values are over 40 percent of the applicable standard. The 10 percent of the applicable standard limit applies when emission values are below 40 percent of the applicable standard and a more tolerant RA limit is appropriate.

6.13 Commenters IV-D-9 and 11.

Comment: We recommend deleting "During the period the monitor is out-of-control, the source owner or operator must use another method of obtaining emission data as required and described in the applicable subpart [e.g., 60.47a(f)]." Many operators are not required to obtain emission data through alternate means if a monitor is out-of-control. For those operations for which such a requirement exists, it is probably adequately addressed through permit conditions or the applicable subpart. As presently worded, it appears that all operators are expected to fulfill this requirement.

Response: The commenter is correct that not all subparts specify CEMS's for compliance monitoring, nor do all subparts require alternative

measurement procedures in the event of a CEMS failure. The purpose of this paragraph in Procedure 1 is to define the effect of an out-of-control period in data availability only for those CEMS's specified for continuous compliance monitoring in the applicable regulation. Procedure 1 has been revised to emphasize the status of the CEMS data collected during an out-of-control period rather than the requirement to conduct alternative testing.

6.14 Commenter IV-D-11.

Comment: Specification of a minimum data capture requirement and allowing the operators to use their own means to achieve the goal is a realistic approach. A reasonable data capture requirement is 60 percent valid data. If a situation develops where data are invalidated, it occurs after the data are collected and plant operations could not have been modified to accommodate these time periods. This validation after the fact serves to enhance the intent of continuous monitoring requirements, limiting emissions of various compounds. Any organization that would take advantage of invalid monitoring data would do this no matter what is required. Any additional requirements to catch these individuals or organizations will only penalize cooperative parties.

Response: It is not the purpose of Procedure 1 to penalize any source operator or owner operating within the requirements of the regulations. Rather, Procedure 1 is designed to establish minimum criteria for accepting or rejecting CEMS data that will be used to show compliance with emission limits. These criteria are as beneficial to the owner/operator as to the regulating agency in assuring that the collected and reported data are valid.

6.15 Commenters IV-D-11 and 35.

Comment: Why should all audits be conducted within the first 2 months of a calendar quarter? If the intent of this requirement is to prevent audits from being conducted at the end of one quarter and beginning of the next, why not simply specify a minimum time frame of 30 days between audits?

Response: The Agency agrees in principle with this comment but has revised Procedure 1 to specify a minimum of 60 days between audits.

6.16 Commenter IV-D-11.

Comment: Methods 6A and 6B must be allowed for audit purposes. These methods will greatly reduce the estimated man years associated with these audit programs and are less error prone.

Response: This is a good suggestion, and such a change is included in the promulgation package as revisions to the applicable subparts.

6.17 Commenter IV-D-11.

Comment: The CGA is actually a two-point precision check. It seems that a more appropriate means of "auditing" would be to use three gases that cover the entire range of the the instrument. The appropriate concentrations would be 0-5 percent, 45-55 percent, and 85-95 percent of full scale.

Response: The Agency disagrees with the commenter's definition of the CGA. A precision check is a measure of the CEMS's capability to repeat successively a specific value; whereas, the CGA is a measure of the CEMS's capability to measure accurately a known value or input. For the CGA, the CEMS is tested for an average response to each of two cylinder gases.

The concentrations of gases used in the CGA are intended to represent and bracket the levels of emissions expected from a source in compliance with the applicable standard.

The commenter's suggestion of a three-point calibration check would be a very good QC procedure for preparing the CEMS for operation and for periodic checks of instrument integrity and linearity. Such a procedure would be appropriate as part of the QC program required in Section 3 of Procedure 1.

6.18 Commenters IV-D-11, 17, and 37.

Comment: Methods 6, 3, and 7 should be allowed for use in determining cylinder gas concentrations. This would be far cheaper than purchasing the specified gases.

Response: The Agency has determined that an independent analysis of audits is necessary and has established a policy of traceability to NBS gaseous SRM or gas manufacturers' CRM for cylinder gas standards used for independent audits. The Agency does not plan to allow the use of RM's for these analyses.

6.19 Commenters IV-D-11 and 31.

Comment: If the average percent difference between our audit value and our monitor value exceeds 20 percent, we consider the CEMS to have been and to be "out of control." Allowing 25 percent error devaluates the CEMS data base. It is important to note these same requirements will probably be used for any monitoring systems used for compliance determination.

Response: The calculation of RA includes two factors. First is the mean relative error which is the difference between the mean CEMS value and the mean RM value. The second is the 95 percent confidence interval based on the standard deviation and a statistical t-test calculation. The 20 percent limit (25 percent for six-run average) imposed in PS 2 and Procedure 1 represents an acceptable maximum value for the sum of these two factors. The limit allows not only for any actual error or difference between the CEMS response and RM results, but also for the inherent imprecision in both of the measurement methods. It is misleading to state that the limit allows for up to 20 or 25 percent difference between the CEMS response and the RATA when calculation of the RA includes a confidence interval. Procedure 1 has been revised from the proposal to require one nine-run RATA per year and the limit of accuracy is 20 percent.

6.20 Commenter IV-D-13.

Comment: The proposed use of cylinder gases as a substitute for the more expensive RAA creates its own set of problems for both extractive and probe-type in-situ analyzers. Many extractive systems by-pass the entire probe assembly so that effects of plugging, condensation, reactions or leakage are not tested. Probe-type in-situ analyzers face the challenge of inserting the cal gas quickly enough that the stack gas does not infiltrate the sample through the porous probe but not so quickly that the gas cannot temperature-stabilize or becomes pressurized. This is further complicated

by the fact that the porous probe may or may not be partially clogged, which of course changes the optimal flow rate. In many applications of probe-type in-situ analyzers, sealed cells have been found to correlate with RAA's better than the cylinder gases. A CGA does not directly compare any values with the existing parameters in the stack gas. A dynamic system cannot be audited by a static check of precision. Data from the CGA is totally different from data obtained during an RAA. These data cannot be compared because they measure different items.

Response: The Agency has performed CEMS evaluations including CGA's, gas cell audits, and RAT's at many sites. Results of these tests show that the CGA, where applicable, is a reliable indicator of CEMS performance when applied as specified in Procedure 1. The results using gas cells were less conclusive and, thus, gas cells are not included in Procedure 1 as an acceptable audit.

6.21 Commenter IV-D-13.

Neither a CGA nor the use of gas cells represents an RAA. Neither checks for changes in stratification or interfering species. Neither lasts long enough to track the effect of temperature or load changes.

Response: The Agency agrees with this comment on the face of it. However, the commenter is concerned that the gas cell audit procedure ought to be allowed if the Agency requires a quarterly accuracy audit and allows a CGA as a substitute for three of four quarters. The Agency believes that the CGA procedure has been demonstrated as a reliable indicator of CEMS

performance where applicable. While the CGA is not the same as an RAA, it does provide an independent check of most of the active components of the CEMS and results of comparisons with RAA results have shown this to be true.

The Agency has found that checks using gas cells are not as reliable as CGA checks. Agency studies have indicated that successful completion of a gas cell audit is not assurance that the CEMS is operating properly nor that it will pass an RAA.

6.22 Commenters IV-D-13 and 30.

Comment: The use of the CGA does not represent a position consistent with the mandate in the Clean Air Act. The CGA favors technologies that do not represent advances in spectrographic methods to monitor pollutant emissions. This discourages research and development for new instrumentation which could improve the current state-of-the-art. Exclusive use of RAA procedures would stimulate research for incorporating advanced spectrographic techniques into CEMS instruments. It would create a market demand for new and improved equipment.

Response: The Agency believes that the CGA is a technically acceptable, demonstrated, independent auditing procedure for CEMS's. Approval of a such a demonstrated alternative procedure is not favoritism nor is it discouragement of the development of other procedures. The Agency will continue to review and publish alternative procedures as they become available.

6.23 Commenter IV-D-13.

Comment: There is good documentation that, properly designed and used zero jigs and fixtures provide a good indication of the "stack zero" for in-situ monitors. Attachment B shows typical results in which the zeros and calibrations found using (1) a purged zero pipe, (2) a zero jig, (3) the incremental calibration method, all agreed to an accuracy better than the quality of most cylinder gases.

Response: The material in the commenter's attachment describes calibration error tests using the three approaches for an in-situ, cross-stack CEMS. The results of the three calibration approaches agree fairly well, as indicated by the commenter. However, there are no RAA's indicating whether these procedures actually indicate the capability of the CEMS to measure stack gas emissions accurately.

The proper calibration of a CEMS is an important tool for operation and maintenance of the equipment. Regular calibrations should be included in every QC program. If gas cell calibration procedures are determined to be acceptable audit procedures, the Agency will publish them.

6.24 Commenter IV-D-17.

Comment: Section 6.1.2 states that the CGA or "an EPA approved alternative method" is to be used "instead of the RAA." This prevents the use of an RAA on a quarterly basis, unless the RAA is approved.

Response: The promulgation version of this requirement is more clearly worded on this point.

6.25 Commenter IV-D-17.

Comment: When Methods 7C and 7D are promulgated, will these be acceptable for RAA and RATA?

Response: These methods have been promulgated and provisions were made with that promulgation (49 FR 38232, September 27, 1984) to allow their use for RATA and RAA sampling.

6.26 Commenters IV-D-18, 24, 31, and 32.

Comment: The RATA and CGA are equivalent methods. An RATA is not necessary when the CGA accomplishes the same task with fewer labor-hours involved.

Response: While the Agency has determined that the CGA is a reliable indicator of CEMS performance, the CGA is not a substitute for the RATA. The RATA is the only means to assess independently the total CEMS as it measures the pollutant gas concentrations under normal operating conditions. This independent check is necessary periodically to assure that all parts of the CEMS are operating and the data produced are accurate.

6.27 Commenters IV-D-18 and 20.

Comment: The performance audit samples received from EPA do absolutely nothing to audit the CEMS, rather this requirement only challenges the laboratory performing the analytical services for the CEMS certification tests.

Response: The commenter is correct that the RM performance audits apply only to the testing laboratory in the performance of the reference method. The benefit derived from this audit is the assurance that the analysis procedures are performed correctly and the quality of the RM

data used in the RA determination is assured. An audit survey conducted by EPA/EMSL showed that audits are necessary to assure accurate analyses. As the CEMS data are to be used for compliance determinations, the quality of data used to certify the reported results is important to both the operator and the regulatory agency.

6.28 Commenter IV-D-19.

Comment: To improve the accuracy of the CGA, we would recommend the procedure require a minimum of three replicate samples for each audit with the average used to determine the percentage difference.

Response: The Agency agrees with the commenter on this point and has changed Procedure 1 accordingly.

6.29 Commenters IV-D-20 and 28.

Comment: It is recommended that EPA develop a standard data assessment report form similar, if not identical, to Figure 1. This would standardize the reported data throughout the country for ease of comparison.

Response: The Agency recognizes that the responsibility for enforcing its regulation lies with many different organizations. Each different enforcing agency can define the data needed for reporting and the format for those data according to its needs. Procedure 1 offers a suggested report form for Procedure 1 results and recommends its use when no other form is provided.

6.30 Commenter IV-D-21.

Comment: Procedure 1 references performance audit samples for SO_2 and NO_x. What does EPA consider to be acceptable accuracy for analysis of the samples?

Response: The RM's in Appendix A specify the acceptable limits for the performance audit results. The procedures also include provisions for repeating sampling and analysis if the tests are failed.

6.31 Commenter IV-D-21.

Comment: Procedure 1 allows a 25 percent inaccuracy using the RAA. We believe that the present 20 percent should be maintained. Also, we believe that the 15 percent inaccuracy for the CGA should be 10 percent, based on previous performance of CEMS's.

Response: Procedure 1 as promulgated has omitted the 25 percent inaccuracy value and incorporated an annual RATA consisting of nine runs as prescribed in PS 2. Procedure 1 also includes an RAA of only three RM tests for the three quarterly audits between the annual RATA's. For these three-run audits, only the averages of the RM tests and the CEMS responses are compared; that is, no confidence interval is calculated or included in the comparison. Procedure 1 prescribes a limit of 15 percent for acceptable audit results using the three-run RAA approach.

Results from many audits of installed CEMS's using CGA's indicate that a 10 percent limit for the CGA result would be too restrictive. The Agency believes that a 15 percent limit is sufficient indication of CEMS accuracy.

6.32 Commenter IV-D-27.

Comment: The EPA must be aware that the gaseous matrix may affect the response for different analytical methods. For instance, O_2, CO_2, CO, and H_2 in mole-percent amounts can reduce the response (relative to measurement in pure N_2) for the chemiluminescence method for NO_x. Also, pulsed fluorescence analyzers for SO_2 will respond much less to SO_2 in air (at least 1 percent O_2) than to SO_2 in pure N_2. These "quenching" effects are not significant in ambient monitoring where the matrix is quite homogeneous, but can be very significant in process streams that vary widely in background matrix.

Response: Specification of which gas mixture is appropriate for calibrating a certain CEMS is the primary concern of the owner/operator of the CEMS and, of course, the CEMS manufacturer. The Agency is aware of potential problems regarding the indiscriminate use of calibration gases with instruments of different designs. However, it is not within the scope of Procedure 1 to include QC techniques specifically applicable to each CEMS available. Instead, Procedure 1 specifies QA procedures and criteria that are independent of CEMS design as much as possible.

For the specific concerns mentioned by the commenter, the initial PS test of the CEMS, which includes an RAT, would demonstrate whether the appropriate calibration gases were applied. Subsequent quarterly checks would be completed using similar mixtures in the audit gases in order to demonstrate continued proper operation of the CEMS. If other, less suitable mixtures were used for the quarterly audits, the results would

indicate a significant CEMS problem and require corrective action. The corrective action in such a case would be to obtain the appropriate gas mixture.

6.33 Commenter IV-D-27.

Comment: For chemiluminescent NO_x analyzers, a NO_2 to NO conversion efficiency test should be done as part of the quarterly audit and the efficiency included as part of the report. Since source operators should be performing periodic efficiency checks as a part of normal QC, this should not create undue hardship and would ensure at least quarterly checks of the efficiency. Similar tests should be made whenever a conversion of species is necessary for detection.

Response: There are a couple of factors that make this conversion efficiency check less critical for present applications of Procedure 1. First, there is an initial RAT that would determine whether the converter is performing properly, and this is followed by at least an annual RATA. Second, the sources to which Procedure 1 will be applied initially will be large boilers which produce small quantities of NO_2 in relation to the total NO_x. The need for complete conversion is not critical for such sources. This is evidenced by the large number of CEMS's that measure only NO and that have passed the RAT's.

6.34 Commenter IV-D-29.

Comment: Procedure 1 specifies the method for checking the accuracy of a CEMS by performing a CGA. It is our experience the proposed procedure may introduce calibration errors.

These errors can be eliminated by first transferring the calibration gas to a gas sampling bag (e.g., Tedlar). The gas can then be drawn from the bag, duplicating actual operating pressures.

Response: The commenter offers a good procedure for sampling from calibration gas cylinders. There are others, some of which are described in "Gaseous Continuous Emission Monitoring Systems - Performance Specification Guidelines for SO_2, NO_x, CO_2, O_2, and TRS," EPA-450/3082-026. A source operator is responsible for the procedures for calibrating the CEMS. The RATA results performed initially and annually will indicate whether proper calibration procedures are used.

6.35 Commenter IV-D-30.

Comment: Has EPA investigated the feasibility of using a transportable system as an audit for in-situ systems? It is reasonable to request that an alternative audit method be accepted in lieu of the CGA for these systems.

Response: The Agency will review proposed alternative procedures as indicated in 40 CFR 60.13(i). The use of a transportable measurement system would be an attractive option for a utility with many installations. The Agency would invite proposal of such a procedure that included equipment specifications, calibration techniques and criteria, sampling criteria, and RA limits. Reports of field experience and RA data should also be included.

The Agency has evaluated use of instrumental methods as acceptable reference methods and proposed such methods as additions to 40 CFR Part 60. Methods 3A, 6C, and 7C were proposed February 28, 1985 (50 FR 8290). Promulgation of these methods occurred on June 11, 1986 (51 FR 21164).

The methods have been included in this regulatory revision as suitable for the RAT and RATA of CEMS's.

6.36 Commenters IV-D-35 and 38.

Comment: Procedure 1 specifies six rather than the usual nine sets of measurements are required for an RAA. The rule should make clear that an owner/operator has the option for either six or nine measurements, at its election, for an RAA. Otherwise, the Agency's attempt to provide flexibility by allowing only six measurements per RAA could turn out to be more restrictive in some cases.

Response: Procedure 1 as promulgated defines two types of audits using RM's. The first is an annual, nine-run relative accuracy (RATA) as described in PS 2. This is required for every CEMS. The second audit type is a three-run audit (RAA) which is allowed three of four quarters, if a CGA is not used or is not applicable. If desired, the nine-run RATA may be conducted any or all quarters.

6.37 Commenter IV-D-35.

Comment: In regard to the CGA procedure, we believe that the use of ambient air for Audit Point 2 on O_2 diluent monitors with 25 percent full scale range should be allowed. Additional cost savings would be realized, without sacrificing accuracy, by not having to purchase additional calibration gas.

Response: The Agency selected Audit Points 1 and 2 to coincide with the levels of diluent and pollutant gases normally encountered in fossil fuel-fired sources' emissions. The purpose of this is to challenge the CEMS for measurement accuracy at the levels of most measurements. The O_2 level in ambient air, 21 percent, is not within this range.

6.38 Commenters IV-D-35, 36, and 39.

Comment: Determination of when an out-of-control period begins and ends may be crucial, as the proposal provides that data obtained from an out-of-control monitor may not be used to meet minimum daily data-capture requirements under applicable NSPS subparts. When a monitor is out-of-control, an alternate method of obtaining the minimum required emission data is applied. We seek confirmation that an out-of-control period resulting from excessive span drift begins when the fifth consecutive drift check for a monitor exceeds twice the applicable PS in Appendix B. If a monitor fails a quarterly accuracy audit (either RATA, RAA, or CGA), it is our understanding that the out-of-control period begins when the audit results are determined. Monitoring data obtained prior to these points in time would not be invalidated.

Response: The commenters are correct about the beginning of an out-of-control period resulting from excessive span drift. That is, the CEMS is determined to be out-of-control when the fifth consecutive excessive drift measurement occurs or when a single drift determination in excess of four times the limit occurs. The out-of-control period ends when corrective action is completed and the CEMS operates within the 24-hour drift specifications, that is, at the completion of the day during which the CEMS demonstrates acceptable drift performance.

The CEMS is determined to be out-of-control as a result of excessive inaccuracy from the time the accuracy audit sampling is completed. This does <u>not</u> include the time for sample analysis and data reduction. This approach emphasizes the importance of expediting the sample analysis and data reduction. The same applies to the determination of the end of the

out-of-control period; that is, the out-of-control period ends when CEMS completes the audit successfully. The time for sample analysis and reporting is not included.

6.39 Commenters IV-D-23, 35, and 36.

Comment: A major component of the cost of complying with the Procedure 1 proposal relates to the actions required if a monitor goes out-of-control. Corrective action must be taken, and an RATA, RAA, or CGA must be performed within 2 weeks of the corrective action. Moreover, an alternative method of obtaining minimum emission data must be employed during the out-of-control period.

If backup monitors must be purchased for use as an alternative method, an initial capital cost of approximately $30,000 to $50,000 would be incurred for the purchase of each monitor. In addition, each backup monitor would require installation, maintenance, and, presumably, certification.

If approved EPA RM tests are selected as the alternative method, additional testing crews would have to be available for dispatch to a plant on short notice in the event of monitor malfunction. This could necessitate hiring a minimum of two additional crew members per utility, at an approximate annual salary of $30,000 per person, plus other indirect costs such as employee benefits.

If fuel analysis is chosen as the alternative method for an oil-fired generating unit, purchases of sampling and analysis equipment at an approximate cost of $40,000 could be required.

Response: The issues raised by the commenter are related to Procedure 1, but the costs are not directly attributable to implementation

of Procedure 1. The applicable regulations specify the minimum data availability requirements (e.g., Subpart Da), and specify which methods are appropriate alternatives in the event of CEMS inoperation. Procedure 1 defines criteria to use to judge the operation of a CEMS and the acceptability of the data produced. Alternative sampling is required to meet minimum data requirements and planning for this possibility is very much a part of the CEMS QC plan.

A well-developed QC plan can save money for the source in a couple of ways. First, good QC procedures will limit the periods of CEMS inoperation to a minimum and consequently minimize the need for alternative sampling. Second, good planning can result in the best alternative procedure being available at the lowest cost. For example, Method 6B is applicable as an alternative for SO_2 monitoring for Subpart Da and D sources. This procedure is relatively inexpensive in terms of equipment and labor. It is a suitable alternative to CEMS's and fuel monitoring, so no expensive backup monitors or fuel sampling equipment would be necessary.

6.40 Commenters IV-D-35 and 36.

Comment: The minimum requirement of two RAA's per year may itself require forced operation for some types of generating units. If RAA's are required more often because CGA's cannot be performed or because of out-of-control monitors, the probability of forced operation is increased considerably. In effect, forced operation would require the use of less cost-effective generating units in place of more cost-effective generating units simply in order to create the conditions necessary for an RAA.

Response: The promulgated Procedure 1 requires only an annual RATA while quarterly audits can be completed using cylinder gases or an RAA. The annual audit (RATA) is performed as described in PS 2 and requires that the source be operating at more than 50 percent capacity. The Agency believes it is not burdensome to require an RATA once per year. Scheduling of such a test to coincide with operation of the source once per year should not be difficult or cause the source a serious hardship.

The Agency believes it is important to maintain operation of the CEMS regardless of the operation of the source if that CEMS is intended to provide compliance data when the source is operating at production levels. This means that daily drift analyses and quarterly audits are necessary for CEMS's subject to Procedure 1 requirements. It is not necessary for the source to be operating at production loads to conduct a CGA or the drift analyses.

6.41 Commenter IV-D-36.

Comment: The Agency has recognized that requiring an audit for ambient monitors at least once per year is adequate to ensure accuracy. The EPA has demonstrated no reason for more burdensome audit requirements for CEMS.

Response: The continuous compliance programs in 40 CFR Part 60 are not similar to the ambient monitoring programs defined by other EPA regulations. The QA procedures in Procedure 1 are designed to address the particular issues regarding CEMS operation and data production. The commenter included information in an earlier comment that indicated that CEMS operation was prone to drift problems and required frequent

observation, if not maintenance. It appears contradictory now for this commenter to propose a QA program that requires less frequent auditing. The Agency believes that quarterly auditing of CEMS operation is necessary and is promuglating Procedure 1 with this requirement.

6.42 Commenter IV-D-39.

Comment: Include a table in Appendix F which summarizes: (a) those conditions which indicate that the CEMS is out-of-control, (b) what the source must do before certifying or recertifying the validity of data from the CEMS, and (c) any related reporting requirements.

Response: The Agency believes that a summary table is inappropriate for several reasons: (1) there is a great deal of information that would have to be in such a table. This table would be very cluttered and difficult to read in Federal Register type; (2) deleting or abbreviating some of the necessary information to make a smaller table would cause the reader to either err in complying with Procedure 1 or cause confusion and conflict with the specific sections containing the requirements; and (3) the sections in Procedure 1 are clearly written and are complete as promulgated. Further, the QA requirements, while they contain several alternatives for methods and schedules, are not so numerous that technical representatives of the source operators or the regulatory agency cannot understand them.

Section 7. EPA Performance Audit Program

7.1 Commenter IV-D-11.

Comment: Can EPA meet the need for RM performance audit samples required with the implementation of Procedure 1?

Response: The Agency has promulgated QA provisions in Method 6 or 7 specified for compliance testing. The Agency has made the necessary plans with suppliers to have a sufficient supply available for these applications.

Section 8. Calculations for Monitoring Data Precision

There were comments directed at these calculation procedures, but the promulgated Procedure 1 does not include any precision calculations making it unnecessary to address these comments.

Section 9. Calculations for Monitoring Data Accuracy

9.1 Commenter IV-D-6.

Comment: Use of the confidence interval when less than nine tests are conducted is questionable.

Response: It is correct statistically to include the confidence interval with any number of data values in calculating RA. The Agency has reviewed PS test results and determined that the results of RA determinations using six values is not significantly different from results where nine values are used. That is, the number of CEMS's meeting the RA limit was similar for either data set size. However, the Agency has determined that there is a need to reduce the burden of multiple reference method tests for those sources whose CEMS's are not amenable to quarterly audits using cylinder gases. Procedure 1 permits the use of a three-run average value in determining CEMS audit accuracy for these quarters. The three-run test will not include the confidence interval but will compare averages only. The required annual audit for all CEMS's is a nine-run RAT as prescribed in PS 2. The nine-run test will include the confidence interval in calculating RA.

Section 10. Reporting Requirements.

10.1 Commenter IV-D-15.

Comment: The promulgation of Appendix F and Subpart D revisions will result in annual submittal of 100 CEM reports to this State agency from Subpart D sources. The engineering review and audit of these reports will require approximately 300 hours per year. An additional 20 hours per year will be required to record and track this information. This would not be a severe economic burden on our Agency.

Response: The burden of implementing Procedure 1 for Subpart D sources and for the State and local control agencies will be evaluated at the time of any revisions to the regulation.

10.2 Commenter IV-D-12, 24, 28, 30, and 36.

Comment: The requirements in Appendix F could significantly increase recordkeeping and reporting requirements at generating plant subject to the Subparts D or Da NSPS. While we recognize the need for quality emissions data, we doubt that such an increase in labor and associated cost will yield a commensurate improvement in data quality.

Response: Sources subject to compliance monitoring are required to supply all reduced data every quarter, not just for periods of excess emissions. It is the opinion of the Agency that such data must be supported by good QA assessments and that these data shall also be submitted with the compliance data.

A great deal of the data reduction and reporting has been eliminated from the proposal in the promuglated Procedure 1. The precision assessment requirements are no longer required. The Agency believes it is not in conflict with the Paperwork Reduction Act to require the source to supply

information about audits and periods of out-of-control CEMS operation with the quarterly data reports. The other CEMS reporting and recordkeeping requirements are dictated by the applicable, source specific regulations, as well as the general provisions in Section 60.7. For Subpart Da sources, there is a requirement to report CEMS data reduced to the form of the standard, process operation status for the reporting period, calculation factors used, number of data used, and other CEMS related information including QA factors [40 CFR 60.49a(b) and (c)]. Procedure 1 does not significantly increase the reporting requirements as promulgated.

10.3 Commenters IV-D-33 and 36.

Comment: According to EPA, a guideline document entitled "Interpretation and Application of Precision and Accuracy Data" will be issued at a later date. By specifying how data will be interpreted and used, this document will go to the heart of the Appendix F proposal. Accordingly, before promulgating final rules, EPA must make this document available to the public for a sufficient period of time to allow analysis and comment.

Response: The requirement for precision assessment is not included in the promulgated Procedure 1; therefore, the referenced guideline will not be prepared. A guideline entitled "Calculation and Interpretation of CEMS Accuracy Data" has been completed and included as part of the Quality Assurance Handbook. This document merely describes the calculation procedures in detail and there is no significant interperative language. It is not necessary to obtain public comment for such a guideline, nor is it necessary to delay promulgation of Procedure 1 because of it.

10.4 Commenter IV-D-39.

Comment: The policy statement in the Federal Register should be reworded so as not to preclude control agencies from taking into account the QA results when considering CEMS data, but should clearly forbid sources from doing so.

Response: The Agency believes strongly that it is technically incorrect to adjust CEMS results based on RAT information or quarterly audit data. Audit results, including the RATA, invariably include imprecision as well as measurement error. The imprecision and error can be associated with both the CEMS and the audit method results. These measurement factors are the basis for allowing a range of audit results that indicate acceptable CEMS operation (e.g., ±15 percent for the CGA). In addition, the sample sizes for either the quarterly audit or the annual RATA are very small and cover only a brief period of process operation. There is no technical basis for "taking into account the QA results when considering CEMS data" beyond assuring that the audit results are within the specifications.

Preamble. Costs of Implementation

P.1 Commenters IV-D-12, 23, 24, 25, and 36.

Comment: The impact of this proposed requirement has been greatly underestimated. The proposal states the impact on utility boilers subject to Subpart Da will be 80 person-years over the 5-year period from 1984 to 1988. This assumes 77 boilers are subject to the requirements and each boiler requires 620 person-hours annually to meet the requirements. The 80 person-years is in error and should be 124 person-years.

Response: The Agency calculated the number of person-years needed to meet the Procedure 1 requirements recognizing that not all of the Subpart Da boilers would be operating during the entire 5 years. Some of the boilers will start operation earlier than others, and some will not be operating until the very end of that 5-year period. While the commenters' figures represent the most conservative view, the Agency believes the 80 person-year value is also a conservative figure for the efforts needed to implement Procedure 1 for Subpart Da sources. The costs assocated with implementation of Procedure for other source catagories will be evaluated upon promulgation of revisions to those regulations.

P.2 Commenter IV-D-15.

Comment: This State agency recognized the need for a continuing CEMS QA program. We have already installed provisions in many operating permits that relate to CEMS QA. The agency has not received a single objection to these CEMS provisions. The QA requirement would not be a severe economic burden on the affected facilities.

Response: No response is necessary.

P.3 Commenter IV-D-12, 23, 24, 32, 35, 36, 37, and 38.

Comment: The level-of-effort required by the current proposal has been substantially understated. For example, EPA based labor estimates on a unit having one SO_2 monitor and one NO_x monitor. However, Subpart Da sources also have to monitor flue gas desulfurization (FGD) inlet SO_2 and diluent concentrations in order to calculate removal efficiency. Therefore, EPA has underestimated the number of monitors affected by Appendix F by a factor of two.

Response: The Agency agrees that the cost estimates in the proposal were derived for only an outlet CEMS. However, adding the costs incurred by the QA requirements imposed on an inlet CEMS will not necessarily double the costs of applying Procedure 1. The amount of increase would depend on the degree to which tasks can be consolidated and needless duplication avoided. The total cost should be considerably less than twice the conservative costs mentioned in the proposal.

The promulgated Procedure 1 does not include the precision assessment requirement thereby considerably reducing data reduction and reporting costs. Further, the RAT audit has been reduced to one per year with CGA or RAA allowed other quarters.

The preamble to the proposed Procedure 1 included estimated costs of implementation for one SO_2 and NO_x CEMS to be between 450 to 620 labor-hours annually. The cost estimate included two RAA's, two CGA's, and precision assessment efforts. The higher value, 620 labor-hours, was used in determining the industry resources needed for Subpart Da sources.

The Agency has examined the costs of implementing Procedure 1 more thoroughly (a report of these studies is in the docket). Using these latest cost estimates and eliminating the precision assessment efforts that are no longer required, the Agency has determined that the original estimates are reasonable. For the example of a Subpart Da source with an outlet CEMS measuring SO_2, NO_x, and diluent and one CEMS measuring FGD inlet SO_2 and diluent, the estimated level of effort for implementing Procedure 1 as promulgated is from 326 to 704 hours annually depending on

the type of audit used, CGA or RAA. This level is consistent with the estimate described in the proposal and does not significantly change the estimated effect on the industry.

P.4 Commenters IV-D-12, 24, 28, 33, and 36.

Comment: Because of design constraints of our plant's data acquisition system, significant modifications of the system could be required to accommodate the requirements of Appendix F. The labor and cost to implement such modifications are anticipated to be substantial. The EPA should evaluate labor and cost impacts for modifying data acquisition systems during the rulemaking process.

Response: The proposed version of Procedure 1 included precision measurements and calculations that were performed differently from previously required in NSPS regulations (40 CFR 60.13) and from what is considered common practice. Such changes would indeed have caused revisions to many data acquisition systems. However, the promulgated Procedure 1 has omitted this precision determination procedure. Other procedures in Procedure 1 for deleting data when the CEMS is not operating properly and including alternative monitoring capabilities are presently required by other applicable regulations [e.g., 40 CFR 60.47a(f) and (h)] and should already be part of the computer capabilities. Computer-operated CEMS's now meeting NSPS data reduction and reporting requirements should not need modifications to meet the requirements of implementing Procedure 1 as promulgated.

P.5 Commenters IV-D-28 and 36.

Comment: The cost estimates would be realistic if CEMS's in routine service rarely went out-of-control as defined in the proposal. Based on our experience with CEMS's (Lear Siegler SM-810 and CM-50), routine span drift values can often exceed the proposed limits for span drift. From the proposed requirements, it follows that the requirement to "use another method of obtaining the minimum emission data as required and described in the applicable subpart [e.g., paragraph 60.47a(f)]," will come into play quite often. Using EPA Methods 3, 6, and 7 to provide data when the CEMS is out-of-control will greatly add to the resources needed to meet the proposed requirements. This could easily double or triple the required resources.

Response: The Agency has collected data for drift assessment and RA assessment for five, different, representative CEMS installations, including the model mentioned by the commenter. The results of these studies indicate that CEMS's subjected to reasonable levels of QC and maintenance efforts rarely exceed the drift or accuracy specifications in Procedure 1. Each of the CEMS's in this study exceeded the drift specifications less than 1 percent of the period which included over 2 years worth of data. Reports of these studies are in the docket.

The Agency recognizes that not all CEMS's will operate properly all of the time and that significant corrective actions will necessarily add to other operating costs. The Agency also recognizes that good operation and maintenance practices and a sound QC program will minimize the occurrences of out-of-control periods. Part of the effectiveness of

promulgating Procedure 1 and the QA assessments is to encourage the operator of an affected facility to develop an effective QC plan and to follow it. The Agency believes that adherence to such a sound program will not increase significantly the cost of continually operating a CEMS as required by the regulation and may actually reduce operating costs by identifying potential problems before expensive repairs are required and before alternative measurement methods are needed to meet minimum data requirements.

It is necessary that the Agency define criteria by which to judge the validity of CEMS data that are to be used to determine compliance. This is necessary and beneficial for both the source operator and the regulatory agency.

P.6 Commenter IV-D-36.

Comment: The Agency has made no estimates of the burdens that would be involved in developing, implementing, and periodically revising QA/QC programs. Given the potentially significant burdens that are imposed by the proposed QA/QC package, and the absence of any direct environmental benefits flowing from these requirements, the Agency should carefully assess any means of rendering this proposal less burdensome and more flexible.

Response: The background document supplied by the commenter recognizes and supports the need for development and implementation of QC procedures for any CEMS program. Procedure 1 outlines the primary elements of a QC program and specifies that any deficiencies in the

program be reviewed and revised as necessary to maintain adequate CEMS operation. The Agency believes that these are minimum requirements for QC regardless of the promulgation of Procedure 1; in fact, every CEMS manufacturer has similar recommendations for QC programs following CEMS installation. Promulgation of Procedure 1 does not affect the costs of implementing good QC programs.

The primary concern of the commenter is that the additional QA procedures required by Procedure 1 not be excessively burdensome to sources already implementing good QC procedures. While QC programs are necessary for operation of any CEMS, some additional QA procedures are mandatory if the CEMS data are to be used for compliance determination. The promulgated Procedure 1 contains the minimum QA requirements necessary to produce valid and useable CEMS compliance data. The Agency also believes that the costs of implementing Procedure 1 will not be excessive.

P.7 Commenter IV-D-36.

Comment: From a broader perspective, these QA/QC procedures are just a small number of the many existing regulatory requirements that currently apply to CEMS. If EPA assesses the resource burdens of each portion of the many CEMS-related requirements independently, it will, of course, project relatively small impacts. Our estimate of the annualized cost of the equipment and the labor required for routine operation and maintenance of CEMS as well as the costs for collection of backup data, PS tests, QA/QC programs, and recordkeeping and reporting could easily exceed $100 million annually.

Response: The commenter does not provide any background data to support the figure of $100 million. The Agency has discussed the commenter's cost estimates for CEMS operation in earlier responses. In general, the Agency believes the commenter has overestimated the costs and concludes that the actual burden of the implementation of Procedure 1 is not excessive.

The benefit of providing useable, valid compliance data applies both to the source and the regulatory agency. The Agency views the costs as worthwhile for the increased confidence in demonstrating compliance and in instituting any enforcement actions. Source owner/operators further benefit through the availability of continuous, valid information on the operation of the control system and can use such data to optimize operations.

Miscellaneous Issues

M.1 Commenters IV-D-4 and 15.

Comment: This State agency has an ongoing QA program for continuous in-stack monitors within its jurisdiction. Therefore, we support the establishment of official EPA QA procedures for in-stack monitors.

Response: No response is necessary.

M.2 Commenters IV-D-15.

Comment: Some sources which operate SO_2 removal devices rely on SO_2 CEMS to control material usage. Well-calibrated SO_2 CEMS's will aid in conserving raw materials. These companies have advised our Agency that well-maintained instruments are essential to controlling material usage.

We conclude that many sources would maintain accurate SO_2 monitors even without the requirements of Appendix F and Appendix F should not cause a significant new economic burden. We, therefore, recommend promulgation of Appendix F as a reasonable and necessary regulatory action.

Response: No response is necessary.

M.3 Commenters 23 and 25.

Comment: The CEMS data should be used only to monitor operation and maintenance, not to determine compliance.

Response: The decision that CEMS's are appropriate compliance tools for NSPS is not within the scope of this regulatory action. Procedure 1 provides a basis by which to judge whether the data provided by a CEMS are valid for compliance determinations.

M.4 Commenters IV-D-10 and 36.

Comment: According to the notice on the above-referenced rulemaking published at 49 Federal Register 9676 (March 14, 1984), the comment period for the Agency's Appendix F proposal will close on May 14, 1984. We request an extension of the comment period.

Response: The comment period was extended to July 13, 1984, (49 FR 24151).

M.5 Commenter IV-D-36.

Comment: We agree in principle with the desirability of QA and QC procedures for CEMS. Most utilities already apply some form of QA/QC to their emission measurement procedures and instruments in order to ensure that useful data are produced. It is in the source's own interest to produce accurate and reliable data on source operation and maintenance.

The types of QA/QC procedures needed at a given utility plant vary depending on site-specific considerations. For example, the type of QA/QC procedures applied in a specific case will depend on how the data generated from CEMS will be used (e.g., whether the data are to be used for compliance or operation and maintenance purposes), how close to the standard the source is operating, whether the monitoring equipment is being used downstream of FGD control equipment, and the type of monitoring instrumentation that is used.

Response: No response is necessary.

M.6 Commenter IV-D-36.

Comment: Whether monitoring technology can meet EPA's standards will be determined not by the type of QA/QC procedures that EPA establishes in these guidelines, but by research and development work with the technology itself. The Agency should focus its efforts in the research and development area and adopt a less burdensome and more flexible approach to QA/QC requirements.

Response: The Agency believes the technology of CEMS has been developed to the point where it can be applied to continuous compliance determinations. Numerous demonstrations of successful long-term operation have been reported both by the Agency and by industrial users. The Agency is pursuing further study in the areas of alternative auditing procedures and alternative QA schedules, but these studies are intended to review and revise QA requirements rather than develop new procedures. There is no substantive reason for delaying the implementation of Procedure 1 for CEMS's used for compliance monitoring.

M.7 Commenter IV-D-36.

Comment: Because of the site-specific nature of QA/QC, any procedures should be written as guidelines that provide minimum procedures. Although EPA has used this approach in the past (e.g., guidelines for ambient monitors), it has only in certain respects reflected in the QA/QC program required by proposed Appendix F.

Response: The ambient monitoring program is substantially different from EPA's gaseous emission monitoring requirements. The ambient monitors are very specifically defined by design and operation characteristics. Performance criteria are unnecessary if all monitors are of the same design and design criteria can be specified. The same would apply to QC procedures for such monitors. Additionally, data supplied by ambient monitors cannot be used in compliance actions against a specific source.

Procedure 1 applies to CEMS's required under 40 CFR Part 60 regulations and are used for compliance determinations. These CEMS's are not defined by design criteria nor are the conditions under which they operate similar from site-to-site. Performance criteria are necessary for demonstrating that such CEMS's operate properly and the data are valid representation of the emissions. These requirements are beneficial and protective of both the source and the regulatory agency.

Table 2. LIST OF COMMENTERS

Docket Number A-80-29

Docket Item Number	Commenter/Affiliation
IV-D-1	H. Neal Troy, Manager Environmental Control Dept. Owens-Illinois One Seagate Toledo, Ohio 43666
IV-D-2	Joe Francis, Environmental Spec. State of Nebraska Dept. of Environmental Control Box 94877 Lincoln, Nebraska 68509-4877
IV-D-3	Jerry W. Powell, Environmental Control Chemist Texasgulf Chemicals Co. Post Office Box 48 Aurora, North Carolina 27806
IV-D-4	Harold E. Hodges, Technical Secretary Tennessee Air Pollution Control Board 150 Ninth Avenue, North Nashville, Tennessee 37203
IV-D-5	Robert L. Pearson, Administrator Environmental Affairs Public Service Company of Colorado Post Office Box 840 Denver, Colorado 80201
IV-D-6	James K. Hanbright, Director Bureau of Air Quality Control Commonwealth of Pennsylvania Post Office Box 2063 Harrisburg, Pennsylvania 17120
IV-D-7	Donald F Theiler, Director Department of Natural Resources State of Wisconsin Post Office Box 7921 Madison, Wisconsin 53707

Table 2. LIST OF COMMENTERS
(Continued)

Docket Number A-80-29

Docket Item Number	Commenter/Affiliation
IV-D-8	Jack Byrom, Vice President Engineering Sierra Pacific Power Company Post Office Box 10100 Reno, Nevada 89520
IV-D-9	M. S. Litus, Environmental Engineer Tenneco Minerals Post Office Box 1167 Green River, Wyoming 82935
IV-D-10	Peter C. Cunningham Hopping, Boyd, Green, and Sams P.O. Box 6526 Tallahassee, Florida 32314
IV-D-11	Vincent J. Brisini, Environmental Scientist Pennsylvania Electric Company 1001 Broad Street Johnstown, Pennslyvania 15907
IV-D-12	W. F. McGuire, Manager Environmental Protection Department Houston Lighting and Power Co. Post Office Box 1700 Houston, Texas 77001
IV-D-13	Richard L. Meyers, Manager Thermo Electron Instruments 530 Alpha Drive Pittsburgh, Pennsylvania 15238
IV-D-14	W. Neal Kocurek, Vice President Radian Corporation Post Office Box 9948 Austin, Texas 78766
IV-D-15	J. Michael Valentine, Director Division of Air Quality Minnesota Pollution Control Agency 1935 West County Road B2 Roseville, Minnesota 55113-2785

Table 2. LIST OF COMMENTERS
(Continued)

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Docket Item Number	Commenters/Affiliation
IV-D-16	Charles H. Knauss Hunton and Williams Post Office Box 19230 Washington, D.C. 20036
IV-D-17	Daniel L. Todd, Senior Air Scientist Big Rivers Electric Corporation Post Office Box 24 Henderson, Kentucky 42420
IV-D-18	Terry G. Freeze, Corporate Environmental Engineer Mississippi Chemical Corporation Post Office Box 388 Yazoo City, Mississippi 39194-0388
IV-D-19	Roger B. McCann, Director Division of Air Pollution Control Commonwealth of Kentucky 18 Reilly Road Frankfort, Kentucky 40601
IV-D-20	Dwight K. Wylie, Chief Air Division Mississippi Dept. of Natural Resources Post Office Box 10385 Jackson, Mississippi 39209
IV-D-21	Dana K. Mount, Director Division of Environmental Engineering North Dakota State Dept. of Health Bismarck, North Dakota 58505
IV-D-22	Gary D. Myers, President The Fertilizer Institute 1015 18th Street, N.W. Washington, D.C. 20036
IV-D-23	M. E. Miller, Jr., Manager Environmental Engineering Unit R. J. Reynolds Tobacco Company Winston-Salem, North Carolina 27102

Table 2. LIST OF COMMENTERS
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Docket Item Number	Commenter/Affiliation
IV-D-24	Timothy A. Gustafson, Environmental Engineer City of Colorado Springs Post Office Box 1103 Colorado Springs, Colorado 80947
IV-D-25	William B. Marx, President Council of Industrial Boiler Owners 11222 Silverleaf Drive Fairfax Station, Virginia 22039
IV-D-26	Tom King, Vice President, Engineering Bob Alders, EPA Certification Coordinator Measurex Corproation One Results Way Cupertino, California 95014
IV-D-27	J.A. Stuart, Executive Officer South Coast Air Quality Management District 9150 Flair Drive El Monte, California 91731
IV-D-28	Thomas F. O'Masta, Supervisory Engineer, Environmental Dept. Consumers Power Company 212 West Michigan Ave. Jackson, Michigan 49201
IV-D-29	Jeffery D. Mathews, Supervisor Environmental Technical Services Eastman Kodak Company 1669 Lake Ave. Rochester, New York 14650
IV-D-30	Merlin E. Horn, Director Environmental Affairs Wisconsin Power Power and Light Co. 222 West Washington Ave. Post Office Box 192 Madison, Wisconsin 53701

Table 2. LIST OF COMMENTERS
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Docket Item Number	Commenter/Affiliation
IV-D-31	J. C. Edwards, Manager Clean Environment Program Eastman Kodak Company Post Office Box 511 Kingsport, Tennessee 37662
IV-D-32	Olon Plunk, Manager Licensing and Environmental Affairs Southwestern Public Service Company Post Office Box 1261 Amarillo, Texas 79170
IV-D-33	Robert V. Tanner, Vice President Production South Carolina Public Service Authority Post Office Box 398 Moncks Corner, South Carolina 29461
IV-D-34	G. J. Aldina, Stack Systems Specialist Thermo Electron Instruments 108 South Street Hopkinton, Massachusetts 01748
IV-D-35	Peter C. Cunningham Hopping, Boyd, Green, and Sams for Florida Electric Power Coordinating Group, Inc. Post Office Box 6526 Tallahassee, Florida 32314
IV-D-36	F. William Brownell Charles H. Knauss Hunton and Williams for The Utility Air Regulatory Group Post Office Box 19230 Washington, D.C. 20036
IV-D-37	H. B. Coffman, Manager Environmental Services Texas Utilities Generating Company 400 North Olive Street Dallas, Texas 75201

Table 2. LIST OF COMMENTERS
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Docket Item Number	Commenter/Affiliation
IV-D-38	Steven P. Lindberg, Supervisor Environmental Affairs Dept. Cooperative Power Association 14615 Lone Oak Rd. Eden Prairie, MN 55344-2287
IV-D-39	Mark S. Siegler, Chief Technical Support Branch Stationary Source Compliance Div. Office of Air, Noise, and Radiation Environmental Protection Agency Washington, D.C. 20460